

Prescription Order Customer Bundle Position  
Tracking and Display System and Method

5           Reference To Related Applications

This application is a continuation-in-part of U.S. patent application serial number 09/715,439 filed on November 16, 2000 and is currently pending.

Field Of The Invention

10           The present invention relates to a system for tracking a plurality of physical prescription orders being filled through a pharmacy and displaying the status of those orders on a display viewable by customers placing those orders. In particular, it includes a customer specific, position tracking device and display for detecting, identifying, and displaying the location of one or  
15 more prescription orders of at least one customer as the orders travel within a pharmacy and are ultimately bundled together in a location for either customer pickup or filing.

Background

20           A typical local retail pharmacy fills thousands of prescription orders per week. Moreover, as the general population ages and new beneficial drugs are introduced, prescription order volumes to be filled at retail pharmacies are expected to double within the next few years. This present and expected increase in order volume places enormous pressure on pharmacists and other pharmacy workers, who strive to fill each order efficiently, accurately and  
25 quickly.

Most customers have a limited view of how a typical retail pharmacy works. They often think that when they present a written prescription order to a local retail pharmacy, such as at their corner drugstore, a pharmacist will personally greet them, review their order, complete and file the necessary

paperwork required by applicable laws, fill the prescription order, and present the filled order to the customer, all within a few minutes. However, in addition to increasing volume, the traditional retail pharmacist is now faced with a large variety of additional tasks, including obtaining proper insurance payment  
5 authorization, and in some cases verifying the refillability of a particular prescription order. Moreover, orders may now enter the pharmacy through a wide variety of mediums, such as via facsimile, phone call, and e-mail.

In light of the increasing demands and obligations placed on retail pharmacies, they are evolving into more efficient organizations having  
10 numerous employees performing individual tasks associated with filling each prescription order. For example, when a customer presents a prescription to the pharmacy, a clerk may take the prescription order and enter it into a computer system that verifies insurance information. If approved, he or she may then prepare a prescription label to be placed on the package that will  
15 ultimately contain the prescribed drug. The clerk may then present the prescription order and label to a technician, usually stationed at another location within the pharmacy, who will physically fill the prescription by placing the appropriate quantity of the prescribed drug within the bottle and attach the label. Pursuant to applicable laws, a registered pharmacist then reviews the  
20 technician's work, and approves the dispersal of the completed prescription order to the customer. A clerk may then place the filled prescription in a storage area to await customer pick-up. Upon customer pick-up, the clerk files the written prescription order and any other appropriate paperwork related to the transaction, such as signed insurance forms and any informed  
25 consent paperwork. This type of system allows the pharmacy to quickly, efficiently, and economically fill numerous prescription orders.

Given the high volume of prescription orders being filled, the large number of people performing individual tasks associated with filling each

prescription order, and the numerous locations within the pharmacy that a prescription order can be positioned as it is being filled, it is important that the prescription order, and ultimately the filled prescription, be easily located throughout the process. For example, if a particular prescription order is denied payment by insurance, a clerk may hold the prescription order aside while the customer is contacted. If the customer presents himself to another clerk at the pick-up window, while the first clerk is attempting to call the customer at home, the second clerk often has no way of knowing the current status of the prescription order, or where it is in the order filling process. Accordingly, the second clerk is forced to search each location within the pharmacy. Similarly, should a prescription order be inadvertently misplaced within the pharmacy, it is often difficult to find, thereby needlessly delaying the filling process and wasting worker time to locate it.

Moreover, customers typically wait for their prescription orders to be filled, and routinely and repeatedly inquire of pharmacy workers whether their orders are ready. Such activity calls the pharmacy worker away from their primary tasks, thereby further hindering the timely filling of customer's prescription orders.

Some pharmacy vendors have attempted to overcome these problems by offering systems that manually track prescription orders within a pharmacy. In particular, they require the worker at a given station to manually enter into a computer the fact that they have received a particular prescription order at that particular location. Some of these systems also require the pharmacy support worker to manually enter into the computer the fact that the prescription order has left their station, or to identify the new station where they delivered the prescription order.

These systems typically track each prescription order individually. Accordingly, when a customer has a plurality of prescription orders to be filled,

a pharmacy support worker using these known systems must individually code and track each individual prescription order.

Such manual tracking systems require considerable pharmacy support worker time and attentiveness to be used effectively. For example, if it takes  
5 a worker 20-60 seconds to manually enter the location of each prescription order that arrives at a particular worker's station, and that station typically handles 3000-6000 prescription orders per week, then 25-50 hours per week per station would be spent entering this information. If there are numerous stations within the pharmacy, the total time spent within the pharmacy  
10 manually entering such information could easily exceed several hundred hours per week. Moreover, the tracked information is usually only available to the pharmacy staff. Accordingly, customer's still repeatedly interrupt the pharmacy worker's by inquiring into the status of their pending prescription orders.

15 Similarly, some pharmacy vendors have attempted to automate the prescription filling aspect of a pharmacy by incorporating an automatic assembly line process for filling prescription orders. In particular, an operator enters a prescription order into a computer system, which causes a conveyor-type system to deliver an empty vial to an automated drug dispenser. The  
20 filled vial is then automatically matched with a label and presented to a pharmacist for final review and approval. While these types of devices facilitate the quick and efficient filling of prescription orders, they are expensive for use in a retail pharmacy environment, and they occupy a large amount of limited space within the pharmacy. Moreover, they still require  
25 pharmacy workers to perform manual tasks such as verifying insurance and renewability of the prescription, and processing the various forms of prescription orders before and after they are entered into the automated

system. Accordingly, they do not permit the easy tracking of prescription orders as they travel within the automated pharmacy environment.

### Summary Of The Invention

5 The present invention overcomes these and other problems with known prescription order tracking systems. It is an economical and automatic prescription order tracking system that monitors and tracks prescription orders through a retail pharmacy and also preferably displays to customers the status of their prescription orders on an easily readable display.

10 Preferably, a tracking tag having a unique identifier associated with it, is attached to the prescription order, which could be a written prescription form 44 (Fig. 6B), a prescription label 42 (Fig. 6A), or any other tangible medium documenting a request for prescription by a health care provider. Manual or automated tag reading devices are positioned at key locations throughout the retail pharmacy to detect the location of each tag, and its associated attached  
15 prescription order. The detected locations are compiled via a computer system and associated with the customer, such that at any given time the location of the prescription order within the retail pharmacy can be quickly and easily determined, and the status of each customer's order is displayed to the customers.

20 Filled prescription orders can be placed in a large bin having multiple cubbies within it. In a fully automated tracking system, each cubby has a displayed number and a tag reading device received therein. When a pharmacy worker places a filled prescription and the prescription order having the tag attached into an available cubby, the tag reading device within that  
25 selected cubby detects the location of that prescription and paperwork and reports that location to the computer system. Accordingly, when a customer arrives to pick-up their prescription, a pharmacy worker need only enter the customer's identifying information into the computer system and the number

of the specific cubby containing the filled prescription and prescription order can be located. Similarly, the detected presence of a customer's prescription order in a cubby can be used to signal the computer system that the customer's order is ready for pickup. Accordingly, the computer system can command the customer viewable display to display this updated status information, thereby automatically notifying any waiting customers that their order is ready.

A conventional manual tracking system can also be used to track prescription orders placed in the bin. In such a system, each cubby includes a unique location tag readable by a reader operated by the pharmacy worker. To track the location of the prescription order in the bin, a worker merely uses the reader to read the tracking tag of the prescription order, and then reads the location tag associated with the individual cubby into which the prescription order will be placed. The computer system uses these two pieces of information to determine and track which cubby a particular prescription order is in, thereby allowing easy retrieval from that cubby and automated order status display updating as previously described.

The present invention also includes a customer specific, position sensing device for detecting and identifying the location of one or more prescription orders as they travel within a pharmacy and are ultimately bundled together in a location for either customer pickup or filing. Typically the bundle includes one or more prescription orders for a customer, and/or product or information ordered by the customer. With all of a customer's requested information and products having the same customer identifier, pharmacy worker time spent preparing and installing tracking labels and the like, and tracking those labels through the pharmacy and storage area are greatly reduced.

In one preferred embodiment, the tags are unique bar codes with a unique bar code assigned to each customer, and the tag reading devices are bar code scanners positioned throughout the retail pharmacy. In an alternative preferred embodiment, the tags are electromagnetic antenna and the like, and the tag readers are limited range transponders and the like as disclosed in U.S. Pat. No. 6,057,756 to Engellenner, that automatically detect the location of the attached prescription order as it enters and leaves predetermined locations within throughout the pharmacy. The tag readers can be fixed at the particular locations, or portable (i.e. handheld) to facilitate scanning of prescription orders that are compiled in bulk.

The tags themselves can be either rigidly or detachably secured to the prescription order. For example, the tags can be directly secured to the prescription with adhesive or secured within a prescription lid. Also, the tags can be secured to a fastener, such as a paperclip, that is detachably secured to the prescription order. Alternatively, the tag can be rigidly secured to a carrier, such as a basket, and the prescription order and materials related to filling the prescription can be placed in the same carrier throughout the prescription filling process.

Additional objects and advantages of the present invention will be apparent from the detailed description of the preferred embodiment thereof, which proceeds with reference to the accompanying drawings.

#### Brief Description Of The Drawings

Fig. 1 is a schematic view of a fully automated prescription order tracking system in accordance with a preferred embodiment of the present invention.

Fig. 2 is a block diagram of a pharmacy prescription order filling system in accordance with a preferred embodiment of the present invention.

Fig. 3 is an isometric view of a prescription storage bin in accordance

with a preferred embodiment of the present invention.

Fig. 4 is the prescription storage bin of Fig. 3 taken along lines 4-4 of Fig. 3.

Fig. 5 is a fragmentary view of the prescription storage bin of Fig. 3 taken along lines 5-5 of Fig. 3.

Fig. 6A is an isometric view of a first preferred embodiment showing a tracking tag being attached to a prescription label which is attached to the filled prescription.

Fig. 6B is an isometric view of a second preferred embodiment showing a tracking tab being attached to a fastener, which is detachably secured to the prescription order.

Fig. 6C is an isometric view of a third preferred embodiment showing a tracking tab being attached to a carrier containing a prescription order and materials related to filling the prescription order.

Fig. 7 is a block diagram of an exemplary computer system in accordance with a preferred embodiment of the present invention.

Fig. 8 is a block diagram of an exemplary application program in accordance with a preferred embodiment of the present invention.

Fig. 9 is an isometric, schematic view of a tracking system in accordance with a preferred embodiment of the present invention, wherein each customer is assigned a unique tracking code, and all of the products and information requested by a particular customer are assigned the tracking code of the customer requesting the products and information.

Fig. 10A is an exemplar customer display showing a possible order status configuration in accordance with a preferred embodiment of the present invention.

Fig. 10B is an exemplar customer display showing another possible order status configuration in accordance with a preferred embodiment of the



present invention.

Fig. 10C is an exemplar customer display showing a third possible order status configuration in accordance with a preferred embodiment of the present invention.

5        Detailed Description Of Preferred Embodiments

An economical prescription order tracking system 10 that monitors and tracks prescription orders 12 through a pharmacy 14 and displays the status of those orders to waiting customers is shown in Figs. 1-10C.

10        In general and as best shown in Figs. 1, 3, and 5, a prescription order 12 is presented to the pharmacy 14 and assigned an identification tag 16. Tag reading devices 18 are positioned at key locations throughout the pharmacy 14 and in communication with a computer system 20 having a monitor 22, such that the movement of the prescription order 12 throughout the pharmacy 14 automatically detects and records the location of the tag 16  
15        without further worker input. Accordingly, a worker can easily determine the location of the prescription order 12 within the pharmacy by entering commands in the computer system 20 with a user input device such as a keyboard 120 to display the location of the prescription order 12 on the computer monitor 22. Select order status information can also be displayed  
20        on a customer display 200, which is viewable by customers waiting for their orders. The individual elements forming the present invention are discussed in greater detail below.

A.        Exemplar Tracking Devices

25        The tags 16 of the tracking devices should be light weight and economical. One such known device is a bar code label, which would be used in conjunction with multiple bar code scanners serving as the tag reading device. One such device is disclosed in U.S. Pat. No. 4,210,802 to Sakai, the disclosure of which is hereby incorporated by reference. A bar code scanner

would be placed at each station and serves as the tag reading device 18. The worker in that area would simply scan the label as it entered into the area. Each scanner would then be placed in communication with the computer system 20 such that information regarding the customer, his prescription order position, and the status of his order can be readily displayed on the computer system monitor 22.

More preferably and as best shown in FIG. 9, each customer in the system is assigned a unique identifier, such as a tracking number or the like, and all products and information requested by a customer is assigned a tag 16 bearing the customer's identifier. Accordingly, all of the customer's requested information and products can be bundled together either during the prescription filling process or shortly thereafter. Alternatively, as best shown in Fig. 6C, a customer's products and information can be bundled together in a bin 46 bearing a tag 16. As a result, and unlike conventional pharmacy tracking systems, the pharmacy worker need only scan, or otherwise enter tracking information, on the entire bundle, rather than for each item in the bundle. Accordingly, considerable worker time is saved without compromising the affectivity of the tracking system.

Alternatively, an even more automated tracking system that may be used includes using known devices that can locate objects through electromagnetic interrogation of a spatial region to determine the presence of an object. One such system is disclosed in U.S. Pat. No. 6,057,756 to Engellenner, the disclosure of which is hereby incorporated by reference. In general, the tag 16 is an electromagnetic antenna and/or signal receiver which responds either passively or actively to announce the presence (or absence) of an object within a controlled region defined by a broadcasted electromagnetic interrogation signal. Preferably, each tag 16 includes a

coding mechanism for uniquely identifying it with respect to other tags in the system.

The tag reading device 18 is preferably one or more interrogation signal generators, or search beacons, that are simple electromagnet field generators (e.g., radio transmitters or magnetic field coils) which cause specific tags to respond. More preferably, the tag reading devices 18 are transceivers that both transmit an interrogation signal and receive a response signal, echo, or otherwise send a field perturbation, indicating the presence of a specified tagged item within the interrogation region. Each tag reading device's 18 signal is limited to a particular area within the retail pharmacy, thereby allowing the detected signal to indicate the location of the prescription order within the pharmacy.

Alternatively, the tag 16 can include an internal power source and signal generator capable of transmitting a signal, which is read by the tag reading device 18.

Each tag reading device 18 is placed in communication with the computer system such that information regarding the customer, his prescription order position, and the status of his order can be readily displayed on the computer system monitor 22, and thereby facilitate location of the prescription order 10 within the pharmacy 14.

Preferably, the tags are attached to the prescription label 42 (Fig. 6A), detachably secured to the prescription order 44, or rigidly secured to a carrier 46 (Fig. 6C) containing these documents and other materials related to filling the prescription. The tags themselves can be either rigidly or detachably secured to the prescription order. For example, the tags can be directly secured to the prescription with adhesive or secured within a prescription lid. Also, the tags can be secured to a fastener, such as a paperclip, that is detachably secured to the prescription order.

B. Exemplar Pharmacy Prescription Order Filling Procedure

Referring specifically to Fig. 2, an exemplary pharmacy, which is preferably a retail pharmacy, prescription order filling procedure 24 is disclosed. In step P1, a prescription order, which could include a written prescription form 42 (Fig. 6A), a renewable prescription label 44 (Fig. 6B), or any other tangible medium documenting a request for a prescription by a health care provider is presented to the pharmacy either in person, via facsimile, via phone, or via a computer transmission, such as e-mail. A pharmacy worker then reviews the prescription order and attaches a unique tag 16 (Fig. 6A) to it that is readable by a tag reading device 18 (Fig. 6A) to determine its location within the pharmacy.

As shown in Step P2, the pharmacy worker then determines if the prescription order is for a new prescription. If so, the pharmacy worker conducts an initial review (Step P3) which includes checking the available inventory for the prescribed drug (Step P4), determining if there is available insurance (Step P7) and if required, obtaining approval from the insurer and preparing the label and necessary billing and information disclosure paperwork (Step P8).

If the prescription is not new, the pharmacy worker determines if it is refillable (Step P5). If so, the pharmacy worker then conducts the initial review (Step P3) as previously described. If not, the pharmacy worker contacts the prescribing health care provider (Step P6) to determine if the prescription may be refilled. If the health care provider approves of the refill, the pharmacy worker will then conduct the initial review (Step P3) as previously described. If not, the customer will be informed (Step P12). If the health care provider is not available, the prescription order to placed in a

holding area until the health care provider is contacted (Step P13), and the customer is informed of this status.

Regarding Step P4, if the inventory is not in stock, the pharmacy worker typically informs the customer and offers the customer an opportunity to special order the prescribed drug (Step P14). If there is only a partial amount of the prescribed drug in stock, the pharmacy worker will typically initiate a procedure for filling only a partial order (Step P15). This procedure typically includes preparing additional paperwork to alert the customer that only a partial order has been filled, and ordering additional quantities of the prescribed drug.

Regarding Step P7, if the insurance coverage is denied, the prescription order is typically held in an area pending the customer being contacted to request authorization to proceed (Step P16). If the insurer cannot be contacted, the pharmacy has the option to either fill the prescription and alert the customer upon pick-up, or hold the prescription order pending a response from the insurer (Step P17).

After the initial review is complete, the prescription order and related paperwork are presented to a technician for filling (Step P9). The technician fills the prescription order and attaches the label. The technician then presents the filled prescription order and related paperwork to a registered pharmacist for verification (Step P10).

Following verification, the filled prescription is placed in a storage area pending customer pick-up (Step P11). When a customer picks-up the filled prescription, the pharmacy worker complies with applicable customer notice requirements, and obtains the customer's signature (also called "signature capture") confirming that they have received such notice (if applicable) and that they have received the filled prescription (Step P18).

### C. Exemplar Pharmacy Tracking Zones

In practice and referring specifically to Fig. 1, it is more efficient to perform the various steps noted above at spaced apart locations, or zones, throughout the pharmacy. For example, prescription order intake (Step P1 of Fig. 2) and initial review (Step P3 of Fig. 2) can be performed at location Z1 (Fig. 1). Label printing and data entry (Step P8 of Fig. 2) could be accomplished at location Z2 (Fig. 1). Prescription orders waiting from some form of call back either from the customer, the insurer, or the health care provider could be placed at location Z3 (Fig. 1). Orders waiting to be filled could be placed at location Z4 (Fig. 1), orders waiting pharmacist review and approval could be placed at location Z5 (Fig. 1), and approved filled prescription orders could be stored at location Z6 (Fig. 1). Obviously, additional zones (Z7 & Z8) could be added to accommodate a particular pharmacy's practices and procedures.

Preferably each station includes a tag reading device 18 in communication with the computer system 20 for automatically detecting the arrival of the tag 16 attached to the prescription order 12 as it enters each location. More preferably, the tag reading device 18 detects both the arrival of the tag 16 in that station, and the departure of that tag 16 from that station, with the time interval at that station being determined and recorded therefrom.

Each tag reading device 18 is preferably fixed at a particular location so that detecting the presence of a tag near the device also automatically indicates the location of that tag 16 within the pharmacy. The tag reading devices 18 can be rigidly mounted to a work area or station, or portable (i.e. handheld) devices that are operably connected to the station so that it can indicate a location within the pharmacy of a detected tag. Such portable devices facilitate scanning of prescription orders that are compiled in bulk,

such as container of filled prescriptions where each prescription order in the container has a unique tag 18. Such a bulk container full of prescription order could arrive into the pharmacy from an off-site prescription filling station. In situations where the tag reading device can simultaneously detect and record the location of multiple prescription order, a pharmacy worker can wave the tag reading device 18 over the container to record the location of all prescription orders in the container.

D. Exemplar Storage Bin

Space and efficiency can be optimized by storing filled or prescription orders 12 to be held for pick-up into a common storage bin 30. As best shown in Fig. 3, the storage bin 30 includes a plurality of cubbies 32, with each cubby 32 being sized to receive a prescription order 12 and associated filled prescription. Each cubby is uniquely identified 34, such as by being individually numbered, and includes a tag reading device 18 of determining whether a particular tag 16 is received within it. Each tag reading device 18 is in communication with the computer system 20.

When a prescription order 12 is filled, the prescription order 12 and filled prescription are simply inserted into an available cubby 32. Accordingly, the tag reading device 18 associated with that cubby 32 sends a signal to the computer system 20 denoting the particular location and cubby number where the prescription order 12 and filled prescription are held.

This signal also can be used to indicate when a customer's prescription order is ready for pick-up. Accordingly, when the computer system detects that a particular customer's prescription order or orders have been inserted into a cubby, it can send a message to display an appropriate notice on the customer status display 200 alerting the customer that his or her order is ready.

When a customer arrives to pick-up his or her filled prescription, the worker enters the customer's identifying information into the computer system 20, and the particular bin number of the cubby containing the prescription order 12 and filled prescription or the current location in the filling process is displayed. The worker then locates and removes the filled prescription from the identified cubby and presents it to the customer.

The removal of the prescription order 12 from that particular cubby 32 is detected by the tag reading device 18 and reported to the computer system 20, which can then remove the customer's status from the customer display 200. The tag 16 can remain affixed to the prescription order 12 when filed, thereby allowing it to be easily located in the future. Alternatively, the tag 16 may be reused with a new incoming prescription order.

Alternatively, a location reader, such as a hand held bar code reader or the like, can be positioned near the storage bin, with each cubby having a cubby location identifier that is readably by the bar code reader to indicate to the computer system its particular location in the storage bin. Accordingly, a pharmacy worker can update the location of a customer's prescription order in the computer system by scanning the prescription order and scanning the location cubby identifier adjacent to the cubby into which the worker has placed the prescription order. In cases where a customer's order includes a plurality of products or information, the bundling of those products and information as previously described allows the pharmacy worker to only scan the bundle once, instead of each individual product or piece of information in that bundle, prior to inserting it into the cubby.

#### E. Exemplar Computer System

Those skilled in the art will appreciate that an exemplary embodiment of the present invention relies on and incorporates several common features of modern personal computers. The general use, operation, and construction



of a computer system is known and has been disclosed in numerous patents such as U.S. Pat. No. 5,818,447 to Wolf et al. and U.S. Pat. No. 5,752,025 to Shakib et al., the disclosures of which are hereby incorporated by reference.

Referring to FIG. 7, the following discussion is intended to provide a  
5 brief, general description of a suitable computing environment in which the invention may be implemented. Although not required, the invention will be described in the general context of computer-executable instructions, such as program modules, being executed by a personal computer. Generally, program modules include routines, programs, objects, components, data  
10 structures, etc. that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention may be practiced with other computer system configurations, including hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers,  
15 mainframe computers, and the like. The invention may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

20 With reference to FIG. 7, an exemplary system for implementing the invention includes a general purpose computing system in the form of a conventional personal computer 20, including a processing unit 121, a system memory 122, and a system bus 123 that couples various system components including the system memory to the processing unit 121. The system bus 123  
25 may be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory includes read only memory (ROM) 124 and random access memory (RAM) 125. A basic input/output system

126 (BIOS), containing the basic routines that help to transfer information between elements within the personal computer 20, such as during start-up, is stored in ROM 124. The personal computer 20 further includes a hard disk drive 127 for reading from and writing to a hard disk, not shown, a magnetic disk drive 128 for reading from or writing to a removable magnetic disk 129, and an optical disk drive 130 for reading from or writing to a removable optical disk 131 such as a CD ROM or other optical media. The hard disk drive 127, magnetic disk drive 128, and optical disk drive 130 are connected to the system bus 123 by a hard disk drive interface 132, a magnetic disk drive interface 133, and an optical drive interface 134, respectively. The drives and their associated computer-readable media provide nonvolatile storage of computer readable instructions, data structures, program modules and other data for the personal computer 120. Although the exemplary environment described herein employs a hard disk, a removable magnetic disk 129 and a removable optical disk 131, it should be appreciated by those skilled in the art that other types of computer readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disk, Bernoulli cartridges, random access memories (RAMs), read only memories (ROM), and the like, may also be used in the exemplary operating environment.

A number of program modules may be stored on the hard disk, magnetic disk 129, optical disk 131, ROM 124 or RAM 125, including an operating system 135, one or more application programs 136, other program modules 137, and program data 138. A user may enter commands and information into the personal computer 20 through input devices such as a keyboard 140, pointing device 142, and tag reading devices 18. Preferably, a plurality of tag reading devices 18, which are distributed throughout the pharmacy are integrated with a switching device 36 that periodically monitors the status of

each tag reading device 18 and transmits that information to the personal computer 20. Other input devices (not shown) may include a microphone, joystick, game pad, satellite dish, scanner, or the like.

These and other input devices are often connected to the processing unit 121 through serial port interface 146 that is coupled to the system bus, but may be connected by other interfaces, such as a parallel port, game port or a universal serial bus (USB). A monitor 22 or other type of display device is also connected to the system bus 123 via an interface, such as a video adapter 148. A customer display 200 is also connected to the system bus 123 via an interface, such as a display adapter 202. In addition to the monitor and customer display, personal computers typically include other peripheral output devices (not shown), such as speakers and printers.

The personal computer 20 may operate in a networked environment using logical connections to one or more remote computers, such as a remote computer 149. The remote computer 149 may be another personal computer, a server, a router, a network PC, a peer device, a personal digital assistant ("PDA"), or other common network node, and typically includes many or all of the elements described above relative to the personal computer 20, although only a memory storage device 150 has been illustrated in FIG.7. The logical connections depicted in FIG 7 include a local area network (LAN) 151 and a wide area network (WAN) 152. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets and the Internet.

When used in a LAN networking environment, the personal computer 20 is connected to the local network 151 through a network interface or adapter 153. When used in a WAN networking environment, the personal computer 20 typically includes a modem 154 or other means for establishing communications over the wide area network 152, such as the Internet. The

modem 154, which may be internal or external, is connected to the system bus 123 via the serial port interface 146. In a networked environment, program modules depicted relative to the personal computer 20, or portions thereof, may be stored in the remote memory storage device. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

Preferably, a plurality of networked personal computers 20 are positioned within the pharmacy, one at the intake area (Z1, Fig. 1), one at the customer pick-up area (Z9, Fig. 1), and one at the data entry/label area (Z2, Fig. 1).

#### F. Preferred Application Program

The detailed description which follows is represented largely in terms of processes and symbolic representations of operations by conventional computer components, including a processing unit, memory storage devices for the processing unit, and a display device. These operations include the manipulation of data bits by the processing unit and the maintenance of these bits within data structures resident in one or more of the memory storage devices. Such data structures impose a physical organization upon the collection of data bits stored within memory and represent specific electrical or magnetic elements. These symbolic representations are the means used by those skilled in the art of computer programming and the construction of computing devices to most effectively convey teachings and discoveries to others skilled in the art.

For purposes of this discussion, a process is generally a sequence of steps executed by a computing device leading to a desired result. These steps generally require physical manipulations of physical quantities. Usually, although not necessarily, these quantities take the form of electrical,

magnetic, or optical signals capable of being stored, transferred, combined, compared, or otherwise manipulated. It is conventional for those skilled in the art to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, records, files or the like. It should be kept in mind however, 5 that these and similar terms should be associated with appropriate physical quantities for computing device operations, and that these terms are merely conventional labels applied to physical quantities that exist within and during operation of the computing device.

It should also be understood that manipulations within the computing 10 device are often referred to in terms such as adding, comparing, moving, etc. which are often associated with manual operations performed by a human operator. The operations described herein are machine operations performed in conjunction with a human operator or user that interacts with a control device. The machines used for performing the operation of the preferred 15 embodiment of the present invention, as will be understood, include a control device and other suitable input devices.

The preferred method of performing the invention is best described in the flowchart of Fig. 8. In general, in step C1, the computer system 20 initially associates a particular customer with a tag, which has been attached to the prescription order. Preferably, the time of entry, and name or employee 20 number of the worker accepting the prescription order is also recorded and stored in memory.

As the tag enters a first location within the pharmacy, a signal is transmitted from the tag reading device at that location to the computer 25 system (Step C2, Fig. 8). In response to the input signal from the tag reading device, the system updates a location flag to denote that the tag, and its associated prescription order, are currently in that location. The time of entry into that location is also noted, and the name of the worker assigned to that

location is noted and stored in memory. More preferably, the tag reading device at that location also detects when the tag has left the station, and updates the location flag to denote that the tag is no longer at that station. In such case, the time the tag left the station is also noted.

5       As the tag moves from the first location to a second location, a signal is transmitted from the tag reading device at the second location to the computer system (Step C3, Fig. 8). In response to the input signal from the tag reading device, the computer system 20 updates the location flag to denote the new location of the tag, and its associated prescription order. The time of entry  
10   into that location is noted, and the name of the worker assigned to that location is noted and stored in memory. More preferably, the tag reading device at the second location also detects when the tag has left that station, and updates the location flag to denote that the tag is no longer at that station.

      This process continues as the tag and attached prescription order move  
15   through the various locations within the retail pharmacy (Step C4).

      This stored data can then be used to determine the location of the prescription order within the pharmacy. Moreover, the corresponding time and worker information can also be readily compiled to track pharmacy performance (Step C5). For example, the average time it takes for  
20   prescriptions to be filled over a given time frame can be readily determined and displayed to workers or customers, thereby giving them an accurate estimate of how long it will really take for the pharmacy to fill a prescription order. Moreover, the efficiency of each worker at each location can be determined, thereby allowing pharmacy management to more effectively  
25   monitor work flow and productivity issues.

      Similarly, this information can be readily used to automatically monitor the amount of time filled prescription orders remain in their cubbies. Most prescription insurers require that, if possible, filled prescription orders be

returned to stock if they are not picked-up within a set number of days, and the cost of that prescription be credited back to them. The present system can automatically monitor the time a filled prescription has remained in the storage area, flag any filled prescriptions that are overdue for pick-up, and  
5 notify the pharmacy worker of the need to return that particular filled prescription to stock.

In addition, in situations where the tag remains secured to the filled prescription following customer pick-up, the system can automatically detect when that prescription is returned by that customer to be refilled simply by the  
10 customer presenting the empty prescription vial to the pharmacy. Accordingly, the system can automatically monitor whether the requested refill is premature under either insurance rules or pursuant to the health care provider's instructions. If so, the system will automatically notify the pharmacy worker of this discrepancy.

15 G. Exemplar Customer Displays

As shown in Figs. 10A-C, selected compiled process and order tracking information can be displayed on the customer display 200 to inform waiting customers of the status of their orders. For example, in Fig. 10A, the name  
20 210 of the customer and the fact that their order is ready is displayed. Alternatively, to preserve customer confidentiality, a customer can be provided with a unique customer number or other identifying code 212 which is displayed when that customer's order is ready as shown in Fig. 10B. For example, each customer can receive a piece of paper containing the unique identifying code 212 when they initially submit their order.

25 Preferably, the customer display is capable of displaying alphanumeric symbols, thereby allowing it to write words and numbers. Accordingly, as shown in Fig. 10C, specific information regard each pending order can be displayed. For example, the average time to file a prescription compiled by

the computer system can be used to calculate and display an estimated ready time 214 for a particular customer's order. Moreover, the pharmacy can post instructions 216 such as "see pharmacist" or the like, to signal a waiting customer to contact the pharmacy to provide additional information, receive  
5 additional information from the pharmacy, or the like.

The customer display 200 can also display the current time 218 as a further aid to waiting customers.

Such display units themselves are commercially available products. One known display unit that can be readily modified for use in this particular  
10 environment is made by the Microframe Corporation of Broken Arrow, Oklahoma, USA, and sold under the Trademark SERIES 4000.

In view of the wide variety of embodiments to which the principles of the invention can be applied, it should be apparent that the detailed embodiments are illustrative only and should not be taken as limiting the  
15 scope of the invention. Rather, the claimed invention includes all such modifications as may come within the scope of the following claims and equivalents thereto.